AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of managing a radio channel assigned to a mobile terminal in a radio access network that supports a plurality of radio channel data rate capacities, the method comprising:

monitoring usage of the radio channel over an interval of time;

increasing a data rate capacity of the radio channel if the usage remains above a

maximum usage threshold for a first qualified period of time by:~~; and~~

selecting a desired data rate capacity above a data rate capacity of the radio

channel as indicated by a current rate value if the usage remains above a

maximum usage threshold for a first qualified period of time,

requesting that the radio channel be configured for the desired data rate

capacity,

receiving information bearing on an assigned data rate capacity if the request

was granted, and

updating the current rate value to reflect the assigned data rate capacity; and

decreasing the data rate capacity of the radio channel if the usage remains below a

minimum usage threshold for a second qualified period of time.

2. (Previously Presented) The method of claim 1 further comprising:

initiating a guard timer after each increase or decrease of the data rate capacity of the

radio channel; and

suspending subsequent increases or decreases of the data rate capacity of the radio

channel irrespective of the usage of the radio channel until the guard timer

reaches a predetermined time-out value.

3. (Original)   The method of claim 1 further comprising:

monitoring an error rate associated with the radio channel; and

decreasing the data rate capacity of the radio channel if the error rate exceeds a

maximum error rate threshold.

4. (Previously Presented) The method of claim 3 wherein monitoring an error rate associated

with the radio channel comprises monitoring a frame error rate (FER) for communication traffic

carried by the radio channel.

5. (Previously Presented) The method of claim 3 wherein monitoring an error rate associated

with the radio channel comprises determining the error rate as a percent error over a defined

interval of time by:

determining an amount of data sent over the radio channel for the defined interval of

time that had to be re-transmitted; and

computing the percent error using a first value representing the amount of re-transmitted

data and a second value representing a maximum amount of data that could

have been sent over the radio channel over the same interval of time at a current

data rate capacity of the radio channel.

6. (Original)   The method of claim 1 wherein monitoring usage of the radio channel over an

interval of time comprises determining the usage as a percentage utilization at a current data

rate capacity of the radio channel by:

determining an amount of new data sent over the radio channel over the interval of time;

and

computing the percentage utilization using a first value representing the amount of new

data and a second value representing a maximum amount of data that could

have been sent over the radio channel over the same interval of time at the

current data rate capacity of the radio channel.

7. (Original) The method of claim 6 wherein the interval of time comprises one or more

transmission frame times of the radio access network, and wherein determining an amount of

new data sent over the radio channel over the interval of time comprises determining a total

number of new data octets sent over of the radio channel during the interval of time.

8. (Previously Presented)   The method of claim 1 further comprising:

initiating an up-delay timer after certain decreases of the data rate capacity of the radio

channel; and

suspending subsequent increases of the data rate capacity of the radio channel

irrespective of the usage of the radio channel until the up-delay timer reaches a

predetermined time-out value.

9. (Currently Amended)   The method of claim 8 wherein initiating an up-delay timer after

certain decreases of the data rate capacity of the radio channel comprises:

determining if an up-delay trigger criteria is satisfied by determining if the usage of the

radio channel falls within a range of about one-half the maximum usage

threshold up to the maximum usage threshold; and

initiating the up-delay timer if the up-delay trigger criteria is satisfied.

10. (Cancelled)

11. (Currently Amended) The method of claim ~~10~~ 1 further comprising:

> determining whether it is permissible to increase the data rate capacity of the radio
>
> channel beyond an initially allocated data rate capacity; and
>
> performing the steps of selecting, requesting , receiving , and updating only if it is
>
> permissible to increase the data rate capacity of the radio channel beyond the
>
> initially allocated data rate capacity.

12. (Original) The method of claim 11 wherein determining whether it is permissible to increase the data rate capacity of the radio channel beyond an initially allocated data rate capacity comprises accessing subscriber-specific information bearing on a subscriber associated with the mobile terminal to which the radio channel is assigned.

13. (Original) The method of claim 11 wherein determining whether it is permissible to increase the data rate capacity of the radio channel beyond an initially allocated data rate capacity comprises accessing system configuration information that indicates whether the increase is permissible.

14. (Currently Amended) The method of claim ~~10~~ 1 wherein requesting that the radio channel be configured for the desired data rate capacity comprises sending a request to an associated process in the radio access network that controls radio channel allocation and configuration.

15. (Currently Amended) The method of claim 1 wherein decreasing the data rate capacity of the radio channel if the usage remains below a minimum usage threshold for a second qualified period of time comprises:

comparing a usage of the radio channel to fractional thresholds of the minimum usage

threshold; ~~and~~

selecting ~~a~~ the desired data rate capacity based on between which of the fractional

thresholds the usage lies; ~~and~~

requesting that the radio channel be configured for the desired data rate capacity;

receiving information bearing on ~~an~~ the assigned data rate capacity if the request was

granted; and

updating ~~a~~ the current rate value to reflect the assigned data rate capacity.

16. (Previously Presented)   The method of claim 1 further comprising:

decreasing the data rate capacity of the radio channel if an error measurement for the

radio channel exceeds a maximum error threshold;

setting an up-delay timer to a desired expiration period; and

suspending subsequent increases in the data rate capacity of the radio channel

irrespective of channel usage until the up-delay timer expires.

17. (Original)   The method of claim 16 further comprising configuring the expiration period of

the up-delay timer based on a current data rate capacity of the radio channel with respect to a

maximum data rate capacity as defined by the radio access network.

18. (Original)   The method of claim 1 wherein the radio access network is an IS-2000 based

network, and wherein monitoring usage of the radio channel over an interval of time comprises:

monitoring Radio Link Protocol (RLP) usage over an interval of one or more

transmission frames; and

determining an amount of new RLP data sent during the interval.

19. (Currently Amended) The method of claim 18 wherein the radio channel is a supplemental channel in the IS-2000 based network and <u>requesting that the radio channel be configured for the desired data rate capacity</u> comprises issuing a request for a base station controller within the IS-2000 based network that is managing the radio channel to increase the data rate capacity of the supplemental channel to a higher one of a defined number of data rate settings.

20. (Original) The method of claim 18 wherein the radio channel is a supplemental channel in the IS-2000 based network and further comprising de-allocating the supplemental channel if the usage of the radio channel is below the minimum usage threshold and a current data rate capacity of the supplemental channel is a lowest defined data rate capacity.

21. (Original) The method of claim 1 further comprising de-allocating the radio channel if the usage is below the minimum usage threshold and a current data rate capacity of the radio channel is at a minimum data rate capacity as defined for the radio access network.

22. (Original) The method of claim 1 wherein the radio access network is an IS-2000 based network and the radio channel is a supplemental channel, and further comprising:

 before initial allocation of the supplemental channel to the mobile terminal, determining
   whether a fundamental channel that is allocated to the mobile terminal has a
   sufficient data rate capacity; and

 allocating the supplemental channel to the mobile terminal if the data rate capacity of the
   fundamental channel is not sufficient.

23. (Original)   The method of claim 22 further comprising selecting an initial data rate capacity of the allocated supplemental channel based on subscriber-specific information associated with the mobile terminal.

24. (Original)   The method of claim 22 wherein determining whether a fundamental channel that is allocated to the mobile terminal has a sufficient data rate capacity comprises monitoring a data queue length used to queue communication traffic sent over the fundamental channel to determine whether a defined maximum data queue length is exceeded.

25. (Original)   The method of claim 22 wherein determining whether a fundamental channel that is allocated to the mobile terminal has a sufficient data rate capacity comprises monitoring packet data size for communication traffic sent over the fundamental channel to determine if a defined maximum packet data size is exceeded.

26. (Currently Amended)   The method of claim 1 wherein <u>updating the current rate value to reflect the assigned data rate capacity</u> comprises assigning a new radio channel to increase a data rate capacity to the mobile terminal.

27. (Currently Amended) A method of data rate management in a radio access network capable of adjusting radio channel data rate capacity, the method comprising:

> monitoring channel utilization for a radio channel carrying communication traffic to a
> > mobile terminal;
> increasing a data rate capacity for said radio channel if channel utilization exceeds a first
> > utilization threshold and if an increase in the data rate capacity is permissible;
> > ~~and~~

decreasing the data rate capacity for said radio channel if channel utilization is below a

second utilization threshold and if a decrease in the data rate capacity is

permissible;

starting a high duration timer to time a period of time that said channel utilization

exceeds said first utilization threshold; and

deferring any action to increase said data rate capacity until said high duration timer

reaches a predetermined high condition count.

28. (Original) The method of claim 27 further comprising:

monitoring an error term associated with said radio channel; and

decreasing the data rate capacity for said radio channel if said error term exceeds a first

defined error threshold and if a decrease in data rate is permitted.

29. (Currently Amended) The method of claim 27 further comprising:

initiating a first timer upon each increase or decrease of the data rate capacity for said

radio channel; and

suspending subsequent increases or decreases of the data rate capacity for said radio

channel until expiration of said first timer.

30. (Cancelled)

31. (Currently Amended) The method of claim 30 27 further comprising:

incrementing a count value of said high duration timer on a periodic basis; and

evaluating whether an accumulated count value of said high duration timer has reached

said predetermined high condition count to determine whether a subsequent data

rate capacity adjustment is permitted.

32. (Original)   The method of claim 27 further comprising:

starting a low duration timer to time a period of time that said channel utilization remains

below said second utilization threshold; and

deferring any action to decrease said data rate capacity until said low duration timer

reaches a predetermined low condition count.

33. (Original)   The method of claim 32 further comprising:

incrementing a count value of said low duration timer on a periodic basis; and

evaluating whether an accumulated count value of said high duration timer has reached

said predetermined low condition count to determine whether a subsequent data

rate capacity adjustment is permitted.

34. (Currently Amended)   A computer readable media comprising software for instructing a

processing system in a radio access network to:

monitor usage of a radio channel assigned to a mobile terminal supported by the radio

access network;

increase a data rate capacity of the radio channel if the usage exceeds a maximum

usage threshold for a defined interval of time; and

decrease the data rate capacity of the radio channel if the usage remains below a

minimum usage threshold for a defined interval of time and;

determine the usage as a percentage utilization value based on comparing an actual

amount of new communication traffic sent over the radio channel over the

defined interval of time versus a maximum amount of communication traffic that

could have been sent if the radio channel was fully utilized.

35. (Original) The computer readable media of claim 34 for further instructing the processing

system to de-allocate the radio channel if the usage falls below the minimum usage threshold

and if a current data rate capacity of the radio channel is at a minimum defined value.

36. (Cancelled)

37. (Original) The computer readable media of claim 34 for further instructing the processing

system to:

determine an error rate for communication traffic sent over the radio channel; and

decrease the data rate capacity of the radio channel if the error rate exceeds a

maximum error rate threshold.

38. (Previously Presented) The computer readable media of claim 37 for further instructing the

processing system to determine the error rate for communication traffic sent over the radio

channel as a percentage error rate by comparing an amount of communication traffic re-

transmitted over the defined interval of time against a maximum amount of communication

traffic that could have been transmitted at a current data rate of the radio channel over the

defined interval of time.

39. (Previously Presented) The computer readable media of claim 34 for further instructing the processing system to:

 initiate a guard timer each time the data rate capacity of the radio channel is increased

 or decreased; and

 suspend subsequent increases of decreases of the data rate capacity until expiration of

 the guard timer.

40. (Original) The computer readable media of claim 34 for further instructing the processing system to:

 selectively initiate an up-delay timer upon decreasing the data rate capacity of the radio

 channel; and

 suspend subsequent increases of the data rate capacity of the radio channel until

 expiration of the up-delay timer.

41. (Previously Presented) The computer readable media of claim 40 for further instructing the processing system to set an expiration period of the up-delay timer in proportion to a current data rate capacity of the radio channel such that the expiration period is longer for higher data rate capacities of the radio channel.

42. (Currently Amended) A base station controller system in a radio access network comprising a processing system operative to:

 allocate a radio channel to a mobile terminal, wherein the radio channel is configured

 with an initial data rate capacity;

 monitor usage of the radio channel based on an amount of communication traffic sent

 over the radio channel over a defined interval of time;

increase a current data rate capacity of the radio channel if the usage is above a defined

maximum usage threshold; and

decrease the current data rate capacity of the radio channel if the usage is below a

defined minimum usage threshold; and

de-allocate the radio channel if the current data rate capacity of the radio channel is at a

minimum and the usage is below the defined minimum usage threshold.

43. (Cancelled)

44. (Currently Amended) The base station controller system of claim 42 wherein the processing

system is further operative to limit data rate capacity increases of the of the radio channel based

on subscriber-specific information associated with the mobile terminal to which the radio

channel is allocated.

45. (Previously Presented) The base station controller system of claim 42 wherein the

processing system is further operative to:

maintain a guard timer that is activated each time the current data rate capacity of the

radio channel is increased or decreased; and

defer subsequent data rate capacity increases or decreases of the radio channel until

expiration of the guard timer to prevent excessive adjustments of the data rate

capacity.

46. (Original) The base station controller system of claim 42 wherein the base station controller

system is a cdma2000-based system and the radio channel is a supplemental radio channel,

and wherein the processing system is further operative to:

allocate a fundamental radio channel to the mobile terminal before allocating the

supplemental radio channel; and

determine whether to allocate the supplemental radio channel based on utilization of the

fundamental radio channel.

47. (Previously Presented) The base station controller system of claim 46 wherein the

processing system is further operative to determine an initial data rate capacity of the

supplemental radio channel based on subscriber-specific information associated with the mobile

terminal.

48. (Currently Amended) The base station controller system of claim 46 wherein the

processing system is further operative to limit data rate capacity increases of the ~~the~~

supplemental channel based on a maximum allowed data rate capacity defined for the mobile

terminal.